

**REMARKS**

Applicants have carefully reviewed and considered the Office Action mailed on March 26, 2009, and the references cited therewith. A review of the claims indicates that:

- A) Claims 1, 4, 9, 12, 15, 18, and 21 are currently amended.
- B) Claims 3, 8, and 22 are previously canceled.
- C) No claims are currently cancelled.
- D) Claims 5-7, 10, 11, 13, 14, 16, 17, 19, and 20 are previously presented.
- E) No claims are currently added.

In view of the following remarks, Applicants respectfully request reconsideration of the rejected claims and withdrawal of the rejections.

**§101 Rejection of the Claims**

Claims 1, 2, 4 - 7, and 9 - 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1, 2, 4 - 7, and 9 - 11 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention.

Applicants have amended claims 1, 4, 9, and 12 to obviate this rejection. Claims 2, 5-7, 10, 11, 13, and 14 depend directly or indirectly from respective one of amended independent claims 1, 4, 9, and 12. Therefore, Applicants respectfully request to withdraw the rejection of claims 1, 2, 4 - 7, and 9 - 14.

§102 Rejection of the Claims

Claims 1, 2, 4 - 7, and 9 - 21 were rejected under 35 USC § 102(b) as being anticipated by Liu et al., (US PAP 2004/0002859).

Independent claim 1

Liu describes about “Method and architecture of digital coding for transmitting and packing audio signals”. Liu et al, in abstract lines 8-11, describes “An iterative rate control loop adjusts the quantization parameters and the quantization step size”. Further Liu et al, in paragraph 48, describes “Thirdly, to avoid the bits allocated to the bands with masking level higher than the noise level, the criteria to minimize the segmental NMR is modified so that the bands with negative NMR should be rounded to 1. That is, the quantization noise for each band should have a lower bound. On the other hand, the **noise higher than the masking threshold leads to a phenomenon that the associated band will be rounded to zero, referred to as the zero bands.** The zero bands are quite perceptually noticeable. So, **the quantization levels should also be restricted to be no larger than the signal energy**”. Furthermore, Liu et al, in paragraph 66, describes “**Since the scale factor  $scale_q$  is in the range of 0 -16 and the minimum scale for these quantization bands must be zero**, thus the global gain is 27 gain<sub>gr</sub> = Max<sub>q</sub> {gain<sub>gr</sub> - scale<sub>q</sub>}.

Moreover, Liu et al, in paragraph 30, lines 14-19, describes “**a comparator 408 compares a prescribed number of bits available and the required length of the encoded data to check if the number of bits available is enough or not for the encoded data**”. Also, Liu et al, in paragraph 28 lines 2-6, describes “**If the number of bits available is not greater than the overall length of the encoded data, a parameter adjustment is made and the quantization step size is increased**”.

In contrast, independent claim 1 recites “A method for quantizing an audio signal in an audio coder, the method comprising: “initializing a quantization step size for each scale factor band of a current frame in the audio signal”, “quantizing each scale factor band of the current frame with the initialized quantization step size”, determining **quantized scale factor bands that are at a vanishing point, wherein the vanishing point is a point where at least the peak**

**value of a spectral coefficient among spectral coefficients in each quantized scale factor band remains non-zero”, “freezing the quantization step size for the determined scale factor bands that are at the vanishing points”, “comparing the number of bits consumed in coding spectral lines in all scale factor bands in the current frame at the quantization step size to a specified bit rate”, “if the number of bits consumed is greater than the specified bit-rate, incrementing the quantization step size for quantizing scale factor bands of the current frame that are not at the vanishing point and repeating the steps of quantizing, determining, freezing, and comparing, wherein the maximum value of the incremented quantization step size for quantizing a scale factor band is the value beyond which the peak spectral coefficient value among the spectral coefficients in that scale factor band becomes zero”, and “if the number of bits consumed is not greater than the specified bit rate, exiting the quantization loop for the current frame”. Support for the amendments can be found in page 2, lines 24-29, page 5 lines 15-23 of the specification, and originally filed provisional application.**

Whereas, Liu et al describes “**the quantization levels should also be restricted to be no larger than the signal energy** (paragraph 48 lines 10-11), i.e., quantization step size is restricted by the **signal energy which is the average energy of the quantization band** (Paragraph 60)”. In contrast, independent claim 1 recites “determining quantized scale factor bands that are at a vanishing point, wherein the vanishing point is a point **where at least the peak value of a spectral coefficient among spectral coefficients in each quantized scale factor band remains non-zero**”. Further, independent claim 1 recites “**wherein the maximum value of the incremented quantization step size** for quantizing a scale factor band is the value beyond **which the peak spectral coefficient value** among the spectral coefficients in that scale factor band **becomes zero**”.

Therefore, independent claim 1 should be found allowable, and such action is respectfully requested.

Claim 2 depends directly or indirectly from the amended independent claim 1, which is patentable for the reasons presented above.

**Independent claims 4, 9, 12, 15, 18, and 21**

**AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111**

Serial Number: 10/774,211

Filing Date: February 6, 2004

Title: SYSTEMS AND METHODS FOR LOW BIT RATE AUDIO CODERS

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Claims 4, 9, 12, 15, 18, and 21 claim substantially the same subject matter as claimed in claim 1.

Claims 5-7, 10, 11, 13, 14, 16, 17, 19, and 20 depend directly or indirectly from the respective one of amended independent claims 4, 9, 12, 15, 18, and 21, which are patentable for the reasons presented above.

For at least the reasons presented above, Applicants respectfully request that the 35 USC § 102(b) rejection of claims 1, 2, 4 - 7, and 9 - 21 be withdrawn.

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**Conclusion**

Applicants respectfully submit that the claims 1, 2, 4 - 7, and 9 - 21 are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney (603-888-7958) to facilitate prosecution of this application.

Respectfully submitted,

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